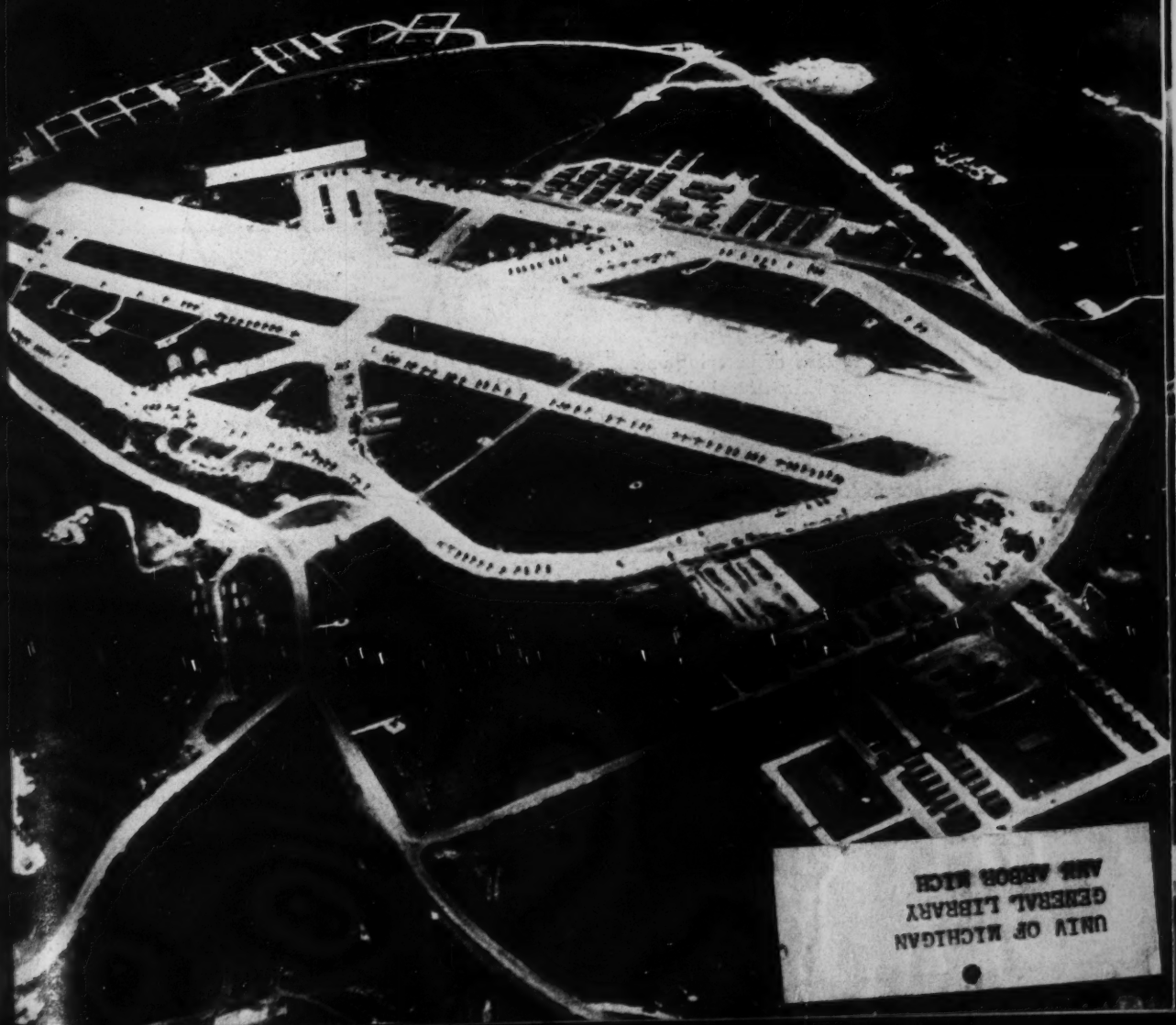
ENGINEERING NEWS-RECORD

pan airbase, one of nine in the Pacific recommended by the Navy for permanent bases



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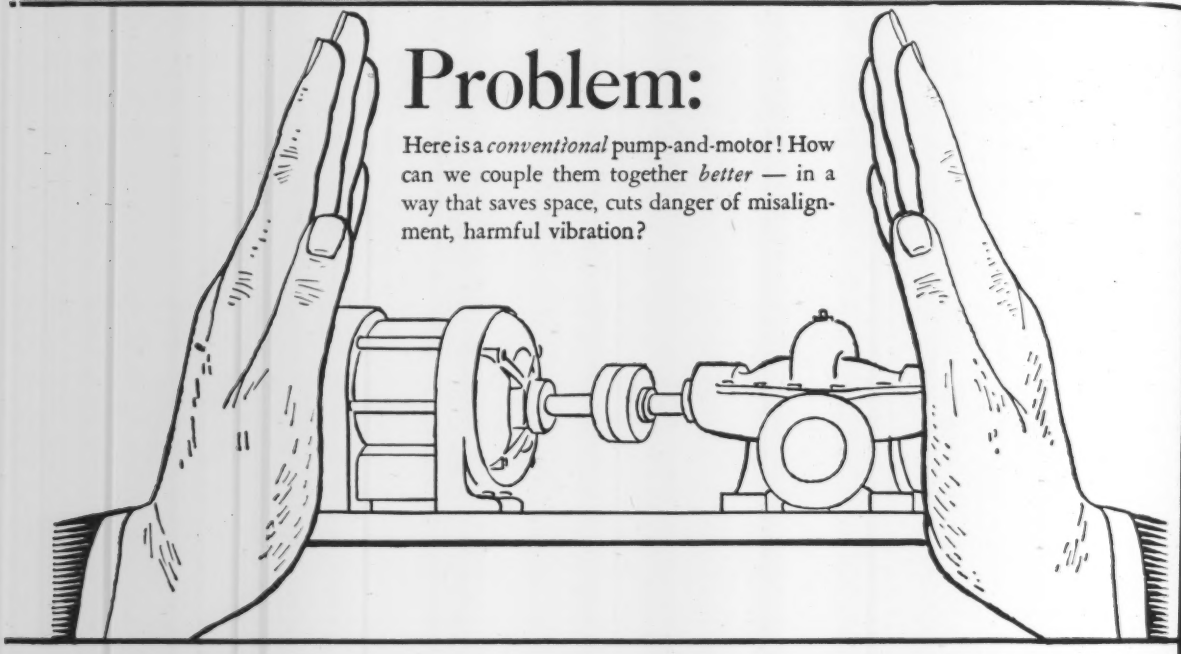

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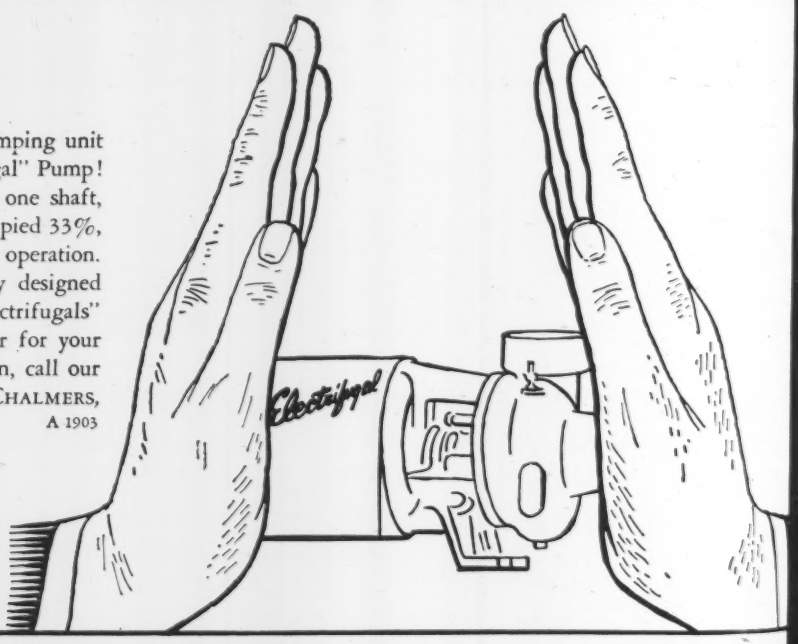

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The Week In Engineering and Construction

GINEERING NEWS-RECORD • SEPTEMBER 27 1945 • VOLUME 135 • NUMBER 13

Atom bomb ruined Nagasaki by pressure and superheat

Harold W. Richardson
Western Editor, Engineering News-Record
(By Press Wireless).

(Mr. Richardson, on a war correspondent assignment that has covered am, the Marianas and Okinawa and will take in the Philippines, arrived in an early this month to look into the effect of the atom bomb on structures. s first report will be followed soon by one containing detailed photographs he damage at both Nagasaki and Hiroshima—EDITOR.)

okyo, Sept. 22—I have just come n examining the effects of the atomic b that was dropped on Nagasaki. that famous Jap seaport you can through the rubble of disinte- ed buildings in the main blast area, stepping putrid messes that were human beings; you can crawl ugh the twisted steel wreckage of big Mitsubishi steelworks; you can ect the spalled walls of interior s in the reinforced concrete medi- school which was seared by blast you can look at toppled mill dings in the Mitsubishi naval tor- plant; you can stand on a bare near the blast center where once d heavy concrete government build- and you can scan an industrial one by three miles in extent that most completely demolished—and you can't believe that what you s the result of a single bomb. There mply no precedent for comparison.

Three types of destruction

estruction is of three types, that ting from direct blast, from sear- uperheat from the bomb and from agrations started by existing open The Nagasaki bomb target was Urakami River industrial district, med in by high side ridges, that med the blast to a long, narrow y. The main business district is e south end, where the river enters bay, and on hills to the east. The b was perfectly placed for maxi- industrial damage, exploding over valley center a half mile north of huge Mitsubishi steelworks and ft. south of the naval torpedo , marking the north end of the trial district. The blast center is located by the orientation of leaning poles and by the direction toward which buildings collapsed.

An area roughly of a half-mile radius around the blast center is completely demolished, including all types of structures. Beyond that, damage lessens according to construction. In general, reinforced concrete stood up best, but some such structures were wrecked or badly damaged as far as three-fourths of a mile from the center of the blast. Heavy brick wall structures collapsed up to one and a quarter miles away. Ordinary Jap houses and stores were wrecked up to two miles, and in freak cases three miles, while large light buildings, such as barracks, were knocked down five miles away. Windows were broken at from seven to ten miles.

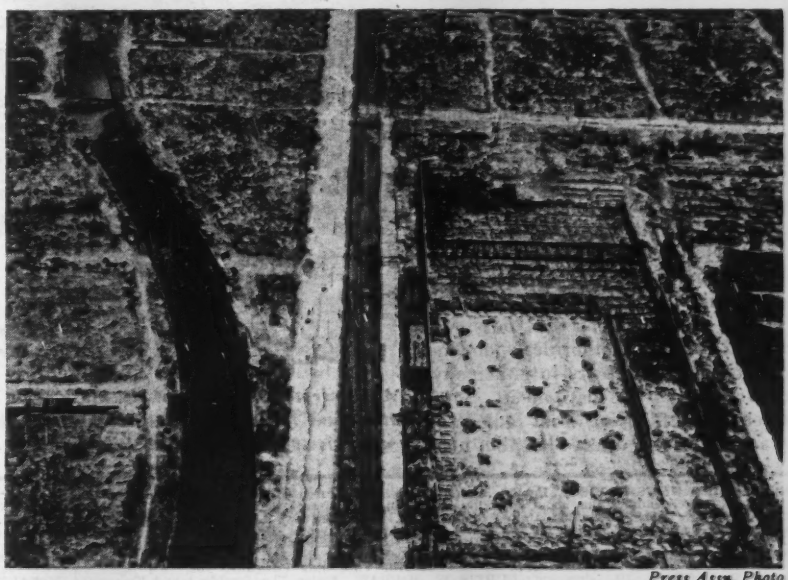
The Mitsubishi steel plant, mostly a steel frame with corrugated metal walls and roof, was reduced to tangled wreckage, with sheeting draped over purlins like bunting. Rows of columns transverse to the blast wave keeled over as if a giant hand had pushed against the eaves, while those longitudinal to the wave stood up better. Piping, shafting, furnaces, etc., were wrecked. Here, evidently, the damage was from blast rather than fire. Inconsistent with other damage, high circular concrete stacks in the plant are standing, although some are cracked at the base.

Simultaneous combustion

On the other side of the blast center, the torpedo plant, of steel and wood mill construction, completely collapsed under the blast pressure where effect is vividly shown by the wreckage of heavy wooden bins of steel and brass stock, which careened along blast axis.

An interesting effect is evident on the

(*Continued on p. 2*)



Press Assn. Photo

Masses of steel and piles of rubble are all that is left of the center of Nagasaki, Japan. The accompanying eye-witness story by Harold W. Richardson is the first authoritative report by an engineer on the real effects of atom-bombing there.

Atom blast wrecks by pressure, heat

(*Continued from first page*)

heavy reinforced concrete medical school buildings on a hillside 2,000 ft. east of the blast center. Although the structures are standing, they are partly shattered and every room, even protected interior rooms, show charring and spalling from terrific heat. Every bit of combustible material—parquet floors, wood wainscoting, furred ceilings, auditorium stage floor—is completely consumed. No charred fragments or ashes remain, indicating simultaneous spontaneous combustion throughout the buildings.

At the medical school, one of two tall concrete stacks is intact, while the top third of another is cracked and tilted away from the blast center. A concrete shop building about the same distance from the blast shows considerable damage. Walls transverse to the blast axis are blown over, while those parallel are still standing; no fire is indicated, the fire wave apparently having been directed somewhat by the winds. A nearby church with heavy brick walls was blown apart, but had no fire damage.

The business section, at the south end of the valley below the steel plant and on the east ridge, is badly damaged, with considerable fire loss. A big area, completely flattened, tapers off into fire and roof damage. There are many freak effects, including high, light steel radio towers in the business section which are still standing, while a big area beyond is demolished. Some "island" buildings are standing amid ruins of similar construction.

Hiroshima report

I have not seen Hiroshima, but Brig. Gen. T. F. Farrell and Brig. Gen. James Newman of the Atomic Bomb Mission report demolition there is even worse than in Nagasaki because of lighter, uniform construction and flat topography. The central area of Hiroshima is completely wrecked except for a few heavy concrete building walls that are still standing.

At the time of inspection, our medical and engineer authorities found no evidence of radioactivity in either city, despite rumors to that effect. Some persons are still dying from radioactivity acquired from direct blast, but none from subsequent exposure. Both bombs detonated high in the air, so that there was no cratering.

Tokyo damage huge

It is very apparent that Japan was already groggy when atomic bombing clinched its defeat. In Tokyo, Yokohama and intervening, industrial Kawasaki, the bomb damage was about 70 percent. Every big industry, airport and airbase in the empire was bombed out. The Japs were desperate for raw materials, especially iron, coal, oil and chemicals. Radiators and piping had been stripped from hotels and office buildings, and all railings and ornamental iron removed for scrap.

Now, the bombed-out populace, living in sheet steel huts amid ruins, faces a tough winter, as does the entire nation. Coal is vitally needed for industries, heating, gas production and for the railroads. Annual coal requirements are 70 million tons, while local production is only 30 million, with output falling. A normal 3 million ton steel production is reduced four-fifths. Hydro power and railroads were kept in excellent condition, while everything else was sacrified for an all-out war. Railroads were running throughout the empire, although handicapped by lack of rolling stock. Food situation is bad.

Maj. Gen. Hugh Casey says that the Army Engineers will build only such facilities as are necessary for our occupation troops, nothing for the Japs. Good airfields are non-existent, so some airport reconstruction will be required, including extension of Heneda airport in Tokyo harbor by a dredged fill so it can be used for an air transport base.

Serious lack of fuel

Quonset huts are arriving for some troop housing, but heating them may require importing coal. The building commandeered for administration offices are also a big problem because the radiators are gone. We are improving miserable Jap roads, while using railroads for transporting troops and supplies instead of roads as originally planned. Reconstruction of cities by Japs awaits available steel, cement, glass and ceramics, in turn dependent upon coal supply. No waterfront work will be necessary, since we found ample berthing space undamaged, though operations will be inconvenienced by mines in the harbors. Many Army and Navy construction units scheduled for here will not be needed.

Press Assn. Photo

A mile from the center of the blast of an atomic bomb at Nagasaki, Japan, struck the giant Mitsubishi Steel Works. But the twisted pile of wreckage—a part which is shown here, is all that was left after the explosion of the bomb.

ENGINEERING NEWS-RECORD. Published every Thursday. Return postage guaranteed. Vol. 135, No. 13. Price 25c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 99-129 N. Broadway, Albany, 1, N. Y., or 330 W. 42nd St., New York 18, N. Y. Subscriptions, United States, U. S. Possessions and Latin American Republics, $5.00 for one year, $8.00 for two years, $10.00 for three years. Canada $6.00 for one year, $10.00 for two years, $12.00 for three years. Great Britain and British Possessions 60 shillings for one year, 120 shillings for three years. All other countries, $10.00 for one year, $20.00 for three years. Please indicate position and company connection on all subscription orders. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U.S.A. Cable Address: "McGrawhill New York." Member A.B.P. Member A.B.C. Copyright 1945 by McGraw-Hill Publishing Company, Inc. All rights reserved. James H. McGraw, Founder and Honorary Chairman. JAMES H. McGRAW, JR., President; CURTIS W. McGRAW, Senior Vice-President and Treasurer; HOWARD EHRLICH, Vice-President (for business operations); WILLARD CHEVALIER, Vice-President (for editorial operations); JOSEPH A. GERARDI, Secretary, and J. E. BLACKBURN, JR., Director of Circulation. Publication office: 99-129 North Broadway, Albany 1, N. Y. Editorial and Executive Office: 330 West 42nd St., New York 18. District Managers and Branch Offices: Fred Hudson, 520 N. Michigan Ave., Chicago 11; 738-9 Oliver Building, Pittsburgh; J. W. Otterson, 68 Post St., San Francisco, 4; Aldwych House, Aldwych, London, W. C. England; Washington: J. M. Spackman, New York; A. B. Cozzens, Philadelphia; E. E. Duff, Jr., Cleveland; B. F. Horn, Detroit and Chicago; W. G. Payne, St. Louis; R. N. Phelan, Los Angeles; J. I. Ballard, Boston; Ralph Maultsby, Atlanta, Ga.

Revocation of L-41 seen as stimulus to early, extensive construction work

WPB takes action over opposition of other agencies that wanted retention of control—OPA price regulations remain

All major War Production Board onstruction controls will be removed ct. 15, when the general control L-41 to be revoked. At the same time the st ceiling of $8,000 per dwelling on w housing will disappear, since forcement of this regulation by the ational Housing Agency will be possible once L-41 is eliminated.

As a result of this action, all types construction are now permitted to ahead regardless of purpose and st.

On Aug. 21 the WPB eliminated all ntrols on industrial construction, and Sept. 7 regulations on highway ojects, construction of transporta- n facilities, and repair and recon- uction work were removed. Limi- ions on construction of electric, gas, ter and wire communication facili- s are to disappear Sept 30 (*ENR* pt. 13, vol. p. 344.) A few weeks o this appeared to be the major re- xation to be expected.

Now, Hugh Potter, construction co- dinator in the Office of War Mobiliza- tion, supported by the Federal Works Agency, has succeeded in achieving complete removal of order L-41. This action is taken despite the opposition of NHA, OPA and the Office of Economic Stabilization. However, PA is seeking congressional approval control the selling price of new and d homes, although Washington con- uction groups see little chance that ngress will approve this plan.

Hugh Potter

OPA price regulations remain

The only remaining government war ulations relating directly to con- uction are the few priority controls limitations orders of the WPB and price regulations of the Office of ce Administration. The WPB prior- setup is now one of only three ngs. These are: an AAA rating for terials for projects of national im- tance; "MM" priority to be used to materials for military projects; and CC" rating to be employed infre- ntly to break severe bottlenecks ountered on civilian construction.

The OPA ceilings, which have been in force since March, 1942, when material prices were frozen, are of two types. One control is the maximum price regulation No. 251 on construction services. By this order a painting contractor, for example, cannot charge higher prices than those under comparable conditions before March, 1942.

The second OPA control still in force is Maximum Price Regulation 592, by which the OPA regulates the manufacturing and retail price of practically all construction materials. The ceilings on a frozen material are to remain in effect until supply has come into balance with demands.

Ceilings to be adjusted

The OPA ceilings, of course, will be adjusted from time to time to aid in adequate production of critical products. For example, Sept. 18 a price increase of $2.00 per 1,000 brick was allowed on common brick manufactured east of the Rockies.

Other similar price increases have been granted recently. These include: an increase of $1.20 per ton in the northeastern section of the country for building lime, an increase on the eastern seaboard of $4.25 per 1,000 sq. ft. in manufacturers' ceiling prices for gypsum lath and gypsum liner board; a price rise of 4 percent or $3.00 per net ton for cast iron soil pipe and fittings; and an adjustment of $2.40 per net ton in manufacturers' prices for calcined gypsum plaster "bag goods."

Most recent surveys show that the greatest shortages in building supplies are those in cast iron soil pipe, brick, structural tile, clay sewer pipe and gypsum board. Price increases granted, in combination with the improved manpower picture, are expected to improve delivery of these materials.

However, WPB also reports that if strikes on the West Coast continue, lumber may remain tight somewhat longer than was expected. When the Japanese war ended, military agencies announced large cutbacks in lumber orders—which was expected to result in adequate quantities being available by the end of September. This favorable outlook resulted in the major relaxation of WPB lumber controls late in August, but not a setback when it was discovered that a sizable part of the "released" military lumber existed merely as earmarked trees.

Recent surveys show that lumber production for the first 7 months of 1945 was 11 percent below the same period last year. Although the manpower problem and the shortage of heavy truck tires still exist in the lumber producing areas, the 1945 total production may approach 29.5 billion b. ft., comparable with the yearly average for the last prewar decade.

Industrial construction upswing continues

Continuing developments in the private construction field, spurred last week by the prospect of early complete release of controls, (*ENR*, Sept. 20, vol. p. 351) included the following items:

The F. & M. Schaefer Brewing Co., of New York City, signed a contract with the Turner Construction Co. of New York for immediate construction of new and enlarged facilities at its Brooklyn plant, at a total cost of about $2,000,000. The work will include five building projects to be completed by spring.

Announcement by Wm. Taylor Son & Co., of Cleveland, Ohio, that it will add five stories to a wing of its store at a cost of about $1,000,000.

At Oakdale, La., the Newport Industries, Inc. announced it would build a $2,500,000 plant for production of rosin and turpentine. Stone and Webster, of Chicago, hold the engineering contract. In California, the California Water Service Co. announced it had plans to begin a half million dollar construction program late this month.

R. H. Macy & Co., New York City, announced it had bought a site on Main St. in White Plains, N. Y., for construction of a $1,000,000 branch there.

The Hercules Powder Co. said that work was under way on a $1,250,000 addition to its naval stores plant at Brunswick, Ga.

Barnes and Reinecke, Chicago industrial designing firm, announced plans for a $2,000,000 building to be known as Techmart, where the firm expects to set up a technological research laboratory capable of handling any industrial design or engineering project.

In Baltimore, the Loch Raven Corp. of New York City, announced it would build a $6,000,000 project involving construction of 900 single-family and 800 apartment units, and garages, stores and offices.

Prices to cover labor contingencies cause rejection of Merriman Dam bids

Bids for completion of rolled-fill dam for New York, halted by war, show increase of 70 percent over those of 1939 contract

The New York Board of Water Supply has rejected bids received Sept. 11, on four years of work to complete Merriman Dam, key structure of the Delaware Aqueduct, located about 85 miles northwest of New York City. Uncertainty of labor costs apparently accounts for a low bid that was nearly $6 million higher than the original.

Construction on the project was started in 1939 under a $15,486,000 contract, but was virtually halted in 1942 when material and equipment could not be obtained under priorities allocated. The caisson cut-off wall, 1¾ miles of tunnel, a 600-ft. shaft and extensive rock excavations were practically completed by the original contractor—Mason & Hanger Co. of New York—and the contract was closed out for $7,425,000.

George M. Brewster & Son, Inc., of Bogota, N. J., was subcontractor for the rolled fill but only 80,000 cu.yd. of the 5,600,000 cu.yd. that will make the dam were placed prior to the shutdown.

Low bid for completion of the project is $13,919,950, whereas under the original contract it would have been about $8,000,000. Of the new bid, $5,208,000 is for the rolled fill. The original bid for the same quantity of fill was $2,688,000. The accompanying table gives unit prices bid in September of this year compared with bids taken in July, 1939.

Labor costs high

Inquiry indicates that the principal reason for the higher bid prices is increased labor cost. Minimum labor rates specified in the contract are 10 to 25 cents per hour higher in some classifications while others remain the same as they were in 1939. However, labor organizations have advised contractors that increases of 15 percent over the stated minimum rate are expected immediately, with an additional 15 percent in another year.

A significant item of increased cost lies in the expectation that larger numbers of employees will demand a full week's pay despite time that may be lost for inclement weather or other causes. During the earlier construction, only hoisting engineers and a few others received this advantage. Also, it is said that workers are demanding at least a 48-hour week with multiple time over 40 hours, and contractors may have to pay premiums for Sunday work when the weather permits placing fill.

Another item contributing to high cost of the rolled fill is said to be "difficult" specifications that provide very narrow moisture limits and very high compaction while placing the fill. But bidders are forewarned by a conspicuous note: "Attention is especially called to the strict requirements with respect to moisture content of material placed in rolled embankment and to the probable necessity of processing this material to remove excess moisture."

Unit Prices, Merriman Dam, New York

Owner: City of New York, N. Y., Board of Water Supply, Roger W. Armstrong, chief engineer.

Project: Completion of Merriman Dam (formerly Lackawack) of Delaware Aqueduct system and effluent chamber for the Rondout reservoir together with its superstructure, waste weir and waste channel and appurtenances.

Conditions: Suitable earth for embankment is available nearby, owner is furnishing some material, equipment for aggregate production and for work at the effluent chamber, taken over from previous contractor. Time for completion, 52 consecutive calendar months compared to 72 months for the original contract. Skilled wages for general construction on project range from $2.25 per hour for hoisting engineers to $1.25 for painters; semi-skilled from $1.65 for some machine operators to 75 cents for helpers and laborers.

Bids: Five bids were opened Sept. 11, 1945, ranging from $13,919,950 to $19,121,050. All bids were rejected Sept. 18, 1945.

List of Bidders:

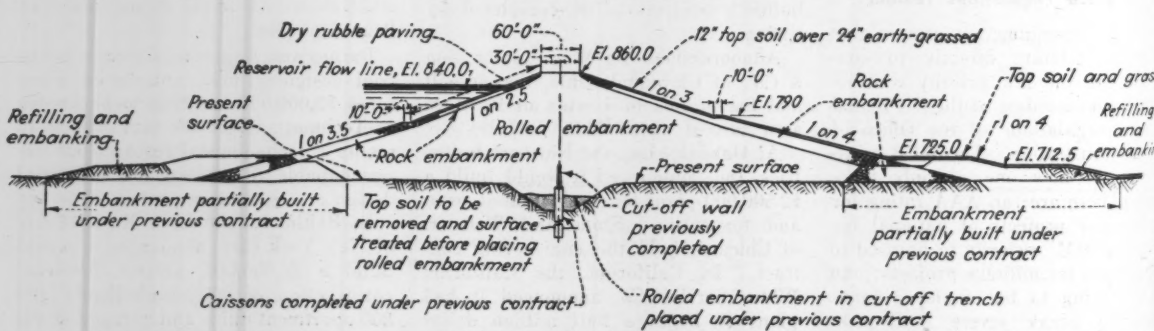
1. S. A. Healy Co., White Plains, N. Y., and Chicago	$13,919,950
2. Del Balso Constr. Corp. and Rusciano & Son Corp., N. Y.	14,602,000
3. Johnson, Drake & Piper, Inc., Foley Bros., S. J. Groves & Sons Co., Jay L. McLaughlin	16,462,130
4. B. Perini & Sons, Inc., C. J. Maney Co., Inc., & Rugo Constr. Co.	16,974,260
5. Merriman Dam Contractors (A Joint Venture of George M. Brewster & Sons, Morrison—Knudson, Western Contg. Corp. & Peter Kewit & Sons	19,121,050

On the original contract, five bids were opened July 25, 1939, ranging from $15,486,130 to $22,134,000. Contract awarded Aug. 16, 1939.

Low Bidders, 1939:

A. Mason & Hanger Co., Inc., New York (contract)	$15,486,130
B. Jahn-Bressi-Bevanda Constructors, Inc., Los Angeles, Calif.	16,195,700
C. Keystone Company, San Francisco, Calif.	16,720,130

Under the original contract a caisson cut-off wall, shaft, tunnel and a large quantity of rock excavation was completed and $7,425,000 paid.



Cross section of Merriman Dam, rolled earth embankment being built for New York City's water supply.

It is generally believed that the subcontractor for earthfill on the original contract found his cost estimates were low owing to the large number of days on which rolled fill could not be placed due to weather and rigid specifications. Significantly, the combination in which the Brewster firm bid recently was the highest of five bidders, submitting a price nearly triple the original bids: $1.40 per cu.yd. compares to $.48 per cu.yd. previously for the rolled fill.

The Board of Water Supply is conferring with the contractors and labor leaders to work out some means of reducing the contingencies not only on Merriman Dam, but on a huge amount of other work so that the cost to the city will not be out of all proportion to its true value. No definite plan has yet been devised, but there is some discussion of fee contracts.

If a solution can be found, the board expects to ask bids by spring on six miles of tunnel and a dam similar to Merriman for the Neversink project. A dam on the East Branch of the Delaware River and 26 miles of tunnel may be started soon.

COMPARISON OF 1939 AND 1945 BIDS ON MERRIMAN DAM

		1945 Bids				† Comparable Items 1939 Bids				
			No. 1				A			
	Item	Quantity			No. 2	No. 3	Quantity		B	C
1	Stream control	L. S.	$30,000.00	$20,000.00	$100,000.00	$150,000.00	L. S.	$20,000.00	$20,000	$25,000.00	$45,000.00
2	Borings	20,000 l. f.	8.00	160,000	4.00	4.70	30,000 l. f.	5.00	150,000	5.00	5.00
3	Removal of buildings	48,000 s. f.	.20	9,600	.25	.15	40,000 s.f.	.20	8,000	.15	.20
4	Removal of soil	10,000 c. y.	.40	4,000	1.00	.50	160,000 c. y.	.50	80,000	.42	1.00
5	Earth excavation	400,000 c. y.	.75	300,000	1.00	.75	1,220,000 c. y.	.35	427,000	.57	.50
6	Rock excavation	160,000 c. y.	4.00	640,000	3.00	5.00	410,000 c. y.	2.20	902,000	1.75	1.80
7	Prepare rock surfaces	4,000 s. y.	10.00	40,000	5.00	4.00	5,500 s. y.	8.00	44,000	5.00	5.60
8	Rolled embankment	5,600,000 c. y.	.93	5,208,000	1.30	1.15	5,600,000 c. y.	.48	2,688,000	.45	.53
9	Refilling and embanking	520,000 c. y.	.50	260,000	.50	.60	1,250,000 c. y.	.10	125,000	.25	.18
10	Rock embankment	750,000 c. y.	.55	412,500	1.25	.60	1,000,000 c. y.	.45	450,000	1.25	.35
11	Surface dress and grass	210,000 c. y.	2.00	420,000	1.00	1.50	170,000 c. y.	.60	102,000	1.50	1.45
12	Timber and lumber	120 M bm.	200.00	24,000	200.00	180.00	300 M bm.	135.00	40,500	100.00	130.00
13	Conc. masonry, open cut	70,000 c. y.	20.00	1,400,000	12.00	30.00	145,000 c. y.	14.00	2,030,000	11.00	11.50
14	Conc. masonry, tunnels	7,500 c. y.	39.00	292,500	12.00	40.00	48,000 c. y.	8.00	384,000	7.00	9.58
15	Dry rubble masonry, paving	55,000 c. y.	13.00	715,000	7.00	15.00	60,000 c. y.	3.50	210,000	10.00	10.00
16	Stone paving in mortar	12,000 c. y.	16.00	192,000	15.00	20.00	11,000 c. y.	5.40	59,400	13.00	14.00
17	Stone masonry in mortar	9,000 c. y.	22.00	198,000	15.00	22.50	27,000 c. y.	13.00	351,000	16.00	16.50
18	Stone facing in mortar	13,000 c. y.	33.00	429,000	40.00	40.00					
19	Furnishing granite facing, coping	30 c. y.	300.00	9,000	100.00	150.00	3,500 c. y.*	100.00	350,000	70.00	114.00
20	Place granite facing, coping	4,400 c. y.	100.00	440,000	75.00	80.00					
21	Brick facing masonry	420 c. y.	125.00	52,500	70.00	80.00	550 c. y.	36.00	19,800	40.00	35.00
22	Brick backing masonry	600 c. y.	60.00	36,000	60.00	50.00					
23	Concrete roof tiles	1,500 s. y.	30.00	45,000	15.00	20.00	1,450 s. y.	14.00	20,300	12.00	14.00
24	Granolithic finish	1,200 s. y.	2.00	2,400	1.00	3.00	850 s. y.	1.00	850	1.00	1.20
25	Protec. coating cem. mortar	1,000 c. y.	20.00	20,000	25.00	20.00	2,000 c. y.	25.00	50,000	25.00	21.00
26	Drill. holes, rock, or masonry	7,000 l. f.	1.50	10,500	2.09	1.50	50,000 l. f.	1.00	50,000	1.00	1.00
27	Steel pipes for grouting	11,000 l. f.	1.50	16,500	1.00	1.00	30,000 l. f.	.80	24,000	1.00	1.60
28	Connections for grouting	600 ea.	4.00	2,400	5.00	4.00	4,000 ea.	3.00	12,000	4.00	4.00
29	Mix. and place. grout	5,000 c. y.	20.00	100,000	20.00	18.00	25,000 c. y.	14.00	350,000	8.00	15.00
30	Concrete pavement	700 c. y.	8.00	5,600	10.00	10.00	1,000 c. y.	6.50	6,500	14.00	8.00
31	Bit. macadam pavement	3,500 c. y.	7.00	24,500	7.00	6.00	3,300 c. y.	6.00	19,800	6.00	5.00
32	Bituminous material	47,000 gal.	.15	7,050	.20	.15	55,000 gal.	.09	4,950	.10	.08
33	Granite curb	1,000 l. f.	8.00	8,000	4.00	5.00	1,300 l. f.	4.00	5,200	5.00	5.00
34	Portland cement	210,000 bbl.	4.00	840,000	3.00	3.00	570,000 bbl.	2.20	1,254,000	2.15	2.30
35	Cr. stone and gravel	4,000 c. y.	3.50	14,000	5.00	5.00	5,200 c. y.	3.00	15,600	3.00	4.00
36	Sand for filters, grout, etc.	1,700 c. y.	4.00	6,800	5.00	3.00	6,000 c. y.	4.00	24,000	3.00	4.00
37	Vit. and asb.-cement pipes	27,000 l. f.	2.00	54,000	1.50	1.65	10,000 l. f.	1.50	15,000	1.00	1.20
38	Reinforced-concrete pipes	3,000 l. f.	6.00	18,000	3.00	5.00	.....	.....	.....	.....	.....
39	Steel for reinforcing concrete	4,000,000 lb.	.07	280,000	.06	.08	6,000,000 lb.	.055	330,000	.055	.065
40	Structural steel	1,100,000 lb.	.08	88,000	.07	.08	1,850,000 lb.	.07	129,500	.08	.07
41	Steel interlining	1,170,000 lb.	.09	105,300	.10	.12	1,130,000 lb.	.09	101,700	.06	.10
42	High-str. iron castings	37,000 lb.	.20	7,400	.30	.25	285,000 lb.	.10	28,500	.10	.14
43	Cast-iron pipes and fittings	42,000 lb.	.15	6,300	.20	.20	83,000 lb.	.10	8,300	.15	.11
44	Misc. c. i., w. i., steel	1,100,000 lb.	.15	165,000	.10	.24	2,200,000 lb.	.12	264,000	.10	.13
45	Galvanizing	540,000 lb.	.06	32,400	.05	.05	650,000 lb.	.03	19,500	.03	.05
46	Al. doors, sashes, frames	50,000 lb.	2.00	100,000	2.00	2.00	48,000 lb.	1.00	48,000	1.20	1.50
47	Al. gratings, ladders, stairs, etc.	52,000 lb.	1.00	52,000	1.50	1.25	135,000 lb.**	.20	27,000	.20	.17
48	Misc. bronze, copper, etc	48,000 lb.	1.00	48,000	1.00	1.00	75,000 lb.	.80	60,000	.60	.70
49	Inst. and test. equip. and metal furn. by city	2,900,000 lb.	.07	203,000	.05	.10	2,000,000 lb.	.04	80,000	.05	.04
50	Painting	110,000 s. f.	.07	7,700	.10	.05	250,000 s. f.	.03	7,500	.05	.045
51	Chlorination, per month	500 mo.	300.00	150,000	100.00	200.00	.....	.....	.....	.....	.....
52	Liquid chlorine	600,000 lb.	.08	48,000	.10	.05	50,000 lb.	.10	5,000	.10	.08
53	Sanitary services	L. S.	125,000.00	125,000	150,000.00	400,000.00	L. S.	75,000.00	75,000	35,000.00	150,000.00
54	Passenger elevator	L. S.	25,000.00	25,000	53,000.00	26,000.00	.....	.....	.....	.....	.....
55	Cleaning up	L. S.	30,000.00	30,000	25,000.00	100,000.00	L. S.	10,000.00	10,000	35,000.00	25,000.00

* Original contract specified sandstone or bluestone. ** Original contract specified wrought iron. † For complete tabulation see ENR June 20, 1940, p. 160

Sewage disposal work major concern in plans for municipal development

Expected growth of communities as well as need for repair and replacement put projects high on spending program

Accelerated activity by municipalities in catching up on war-deferred improvements is being manifested in connection with the installation of sewage disposal facilities. In a roundup of recent developments the following projects were of special interest.

At Cleveland Emil J. Crown, utilities director, announced he had been ordered to proceed with plans and specifications for a $2,175,000 sewage treatment plant enlargement program, which is part of a $7,000,000 overall program to prepare the city's disposal facilities to meet demands anticipated by 1960. Initial work will include extensions at the Southerly plant; additional sludge processing facilities at the Westerly plant, and the installation of sludge removal mechanisms at the Easterly plant.

Mayor Fletcher Bowron of Los Angeles announced that his city was making plans to construct sanitary sewer trunk lines costing $7,500,000 to serve the San Fernando Valley portions of west and southeast Los Angeles. The city engineer's office recommended the work to provide facilities for districts that have developed heavily in recent years.

At Columbus, Ohio, voters will be asked on Nov. 6 to approve bond issues totaling $5,500,000 to finance sewer and sewage plant extensions and improvements.

Baltimore takes bids

Baltimore, Md., with its sewage improvement program already under way, said it had received bids on a $500,000 proposal for construction of two covered sludge digester tanks at the Back River disposal plant. Each tank will have a diameter of 100 ft. and a depth of 25 ft., with a capacity of 400,000 cu.ft. for the two units.

Elyria, Ohio, placed a $1,325,000 bond issue for waterworks and sewer improvements on the election schedule, as did Franklin County, Ohio, which asked voters to approve $1,500,000 for county sewers. A report recommending a modern sewage disposal system for the city of Fresno, Calif., to cost $1,352,700 has been submitted to the city officials. Improvement measures include a treatment plant, and the elimination of objectionable industrial wastes by pretreatment at the source.

Smaller sewage works projects reported: a $244,000 treatment plant at Ocala, Fla.; plans for a $154,200 program at Gatlinburg, Tenn.; and a $200,000 project for Lake City, Fla.

Legal problems

Meanwhile, legal problems, involving sewage disposal and methods of financing new work held interest.

In Pennsylvania, the state sanitary water board cited Ursinus College of Collegeville, five industrial plants, and 22 communities for failure to take steps to start plans for sewage treatment works to curb stream pollution in the state.

The action followed closely Governor Martin's singling out of stream pollution abatement as one of primary importance for the state (*ENR* Sept. 13, vol. p. 339).

The village of Honeoye Falls, N. Y., in action before the New York State Water Power and Control Commission, opposed plans for amplification of supply for the city of Rochester, N. Y. on the ground that reduction of flow in Honeoye Creek would create additional problems for the village's disposal plant which now empties into the creek.

Suburbs of Upper Arlington and Grandview Heights, near Columbus, Ohio, filed suit in Common Pleas Court seeking to restrain the city from discontinuing sewage disposal service. The city council recently adopted a resolution to discontinue the service if the suburbs failed to sign contracts to pay a new 74 cents sewer rental rate. This rate was increased from 55 cents.

The suburban communities contend that the rate is excessive, and countered with an offer of 45 cents. The city contended that the outlying communities did not have the responsibility of keeping the sewers in repair nor of maintaining a disposal plant, and therefore should be prepared to pay "fair" prices for the service.

In Cincinnati, Ohio, the city council considered a sewer rental charge of about $1.80 a month as a means of financing a proposed countrywide sewage disposal project for control of Ohio River water pollution. A program calling for spending of between $17,000,000 and $20,000,000.

Appoint Bunger head of MVA reports section

Mills E. Bunger, Regional Planning Engineer at the Denver Office of the Bureau of Reclamation, has been appointed to head a staff preparing coordinated progress reports on engineering and economic surveys for the Missouri River Basin development.

The studies of the billion and a half dollar development program are being made jointly by eight agencies of the Department of the Interior, and will include preparation of plans and specifications for 11 units of the development plan harnessing the Missouri River for irrigation, power development, flood control, and other purposes.

As chief of the reports staff, Mr. Bunger will coordinate progress reports on the engineering and economic investigations by the various agencies, and supervise preparation of a comprehensive monthly report to insure coordination of the activities of the various groups. An appropriation of $3,200,000 has been made for the survey and planning work.

RFC to sell or lease five oil pipelines

Operation of five government-owned oil pipelines, including the "Big Inch" and the "Little Big Inch" will be discontinued shortly, the Reconstruction Finance Corporation has announced.

The two principal pipelines (*ENR* Dec. 31, 1942, vol. p. 915 and Dec. 30, 1943, vol. p. 933) played a major role in the war. Through them oil was rushed east from the Texas fields, loaded on tankers and sped to troops abroad. They also averted a threatened oil shortage on the eastern seaboard.

The "Big Inch," a 24-in. line, runs from Longview, Tex., to the New York harbor area, a distance of 1,254 mi. The "Little Big Inch" is 20-in. in diameter and extends from Beaumont, Tex., to New York.

The last shipment of petroleum products through the "Little Inch" was scheduled for last week, and the "Big Inch" will become idle about Oct. 2. The recent average cost per barrel of shipping crude oil through the pipelines (excluding depreciation, interest and taxes) was $.28811, and of oil products $.11238.

The pipelines are now offered for sale or lease by the RFC. It is said that informal bids by two Texas and one New York oil company have been received already.

Chicago's $24 million filtration plant placed in partial operation

Chlorination, coagulation and sedimentation of South Side water supply now in process—Full operation to start next year

Chicago started operating its new 4,000,000 South District Filtration ant at 79th St. and Lake Michigan pt. 20, when Mayor Edward J. Kelly ished a control switch in the low t pumping station to start one of the ant's 100-mgd. centrifugal pumps. conds later, as the 54x48-in. electric iven pump reached its operating eed of 240 r.p.m., a large cone valve tomatically opened and water began wing from the intake basin at the st end of the plant into a raw water nduit.

Shortly, another switch opened a ge sluice gate to let water flow into mixing chambers. This was fol-wed by the placing of one of the emical feeders in operation, and ini-l operation of the plant was under y—a few days less than seven years ce construction started.

At the same time, five of the plant's en other centrifugal pumps were ced in operation (two 100 mgd. and ee 50 mgd. pumps) for a total pump-e of 450 mgd. Additional chemical eders also were started.

Original plans envisioned completion the plant by 1942. War, with its ac-mpanying restrictions on building terials slowed up, and at times nearly pped construction.

The dedication ceremonies were wit-sed by some 600 civic officials and uth Side residents. Among those in endance who have been closely con-ted with the design construction of plant were Oscar E. Hewitt, com-ssioner of public works; W. W. De-rd, city engineer; Paul Gerhardt, city architect; John R. Baylis, en-eer of water purification; John Dean, gineer of waterworks construction, l G. Riggenbach, assistant engineer waterworks construction; and a host other city employees who were sely connected with the work.

At present about 100 persons will be uired to operate the plant. It will e a normal capacity of 320 mgd. of ered water, and will serve an area ering 115 sq. mi. or 54 percent of the 's total area. This force is expected be increased to about 130 when ual filtration starts, some time next r. H. H. Gerstein is chief filtration mist at the plant.

Only partial chemical treatment, with gulation and sedimentation, will be en the water until the partially con-structed rapid sand filters are completed. During the interim, the water will be treated with chlorine and aluminum sulfate. At least 70 percent of the impurities in the water will be removed by this treatment.

Other chemicals to be used when the plant is placed in full operation are:

> ***Sealed in a copper box in the cornerstone of Chicago's new filtration plant administration building is a 40-page Engineering News-Record report describing the plant in detail. The report appeared originally in an issue dated June 18, 1942.***

Activated carbon for odor removal and taste improvement; acid-treated sodium silicate to strengthen coagulation as necessary; additional lime to partially soften the water and to increase the rate of precipitation when excess microorganisms require rapid filter runs; ammonia to prevent chlorine tastes; and carbon dioxide or sodium hexametaphosphate to avoid incrustation of water mains when the lime treatment is used.

Briefly the course of the water through the plant, when completed, will be as follows: Raw lake water entering the intake basin at the east end of the plant will be lifted 18 ft. into raw water conduits by the eight centrifugal pumps which have a total capacity of 600 mgd. From that point it will flow by gravity through the plant, through three mixing basins each of which has a 330-mgd. capacity for a 50-min. period of flow. Each mixing basin will discharge into a two-story settling basin having a 330-mgd. capacity during a 3-hr. 36-min. flow at the rated capacity.

From the settling basin the water will pass through 80 rapid sand filters, each of which has a sand area of 1.389 sq. ft. and a nominal capacity of 4 mgd. They will be, however, capable of operating at a much higher rate.

Filtered water will pass into a 15 m.g. reservoir beneath the filters, from where it will flow to two main filtered-water reservoirs at the west end of the plant which have a combined capacity of 32 million gallons. From these reservoirs the filtered water will flow by gravity through the outlet tunnel to the present southwest land tunnel system, to the three pumping stations serving the South Water District.

At present, and until the plant is placed in full operation next summer, the water will bypass the filters, flowing direct from the settling basins into the outlet tunnel and through the pumping stations into the city mains.

On Oct. 1 the Pennsylvania Postwar Planning Commission will begin distribution of a $1,000,000 fund to help finance plans for public works.

Name McLaughlin head of Philadelphia works

Martin J. McLaughlin, chief of the Philadelphia Bureau of Water has been named to succeed the late John H. Neeson as director of public works for the city. Mr. Neeson died (*ENR*, Sept. 6, vol. p. 280), after serving as director of public works since 1940.

Mr. McLaughlin is a graduate of Villanova College Engineering School, and held the post of director of public works previously, having left that position in 1942 to become head of the water bureau. Other engineering service includes an eight-year term as deputy chief of the Bureau of Highways.

He supervised construction of the municipal airport.

Municipal utilities in Ohio to be taxed

Following a recent Ohio Supreme Court decision that municipally-owned utilities operated for profit were taxable, State Tax Commissioner Emery C. Glander has requested county auditors in Ohio to provide his office with a list of such utilities. On the list will be city-owned light plants, water systems and airports. The effective date for the start of taxing these municipal-owned utilities has not been set.

The decision came in a suit involving the city-owned Cleveland Transit System wherein the Board of Education sought to collect taxes from the CTS, which revenue had been lost when Cleveland purchased the street railway and bus lines from the former private owners. In deciding the case the court held the C.T.S. should pay taxes, for both real estate and personal property, because it is a profit-making organization and transportation is not a public service. A rehearing was denied.

MAYOR FLETCHER BOWRON of Los Angeles, Calif., has appointed **Brig. Gen. Joseph Orrin Donovan** and **Capt. Clarence J. Derrick** to the city's board of public works. **Frank Gillelen,** board president, was reappointed for a new five-year term.

C. B. Croasdale, chief engineer in the department of highways of New Brunswick has resigned. He has been chief engineer since 1935 and entered the service as resident engineer in 1920.

George Callison has been appointed superintendent of public works at Forest City, N. C., to succeed **B. B. Green,** who has resigned after 30 years service.

Bert Paxton, who has resigned as county engineer for Butte County Calif., has been appointed to the newly created post of consulting engineer for the county.

Maj. Robert L. Cook, former railway bridge engineer for the Missouri Pacific Railway at Houston, Tex., is now serving as chief of the ports section in New Guinea. He has received the Bronze Star medal for his work there. He is a graduate of Houston Engineering College.

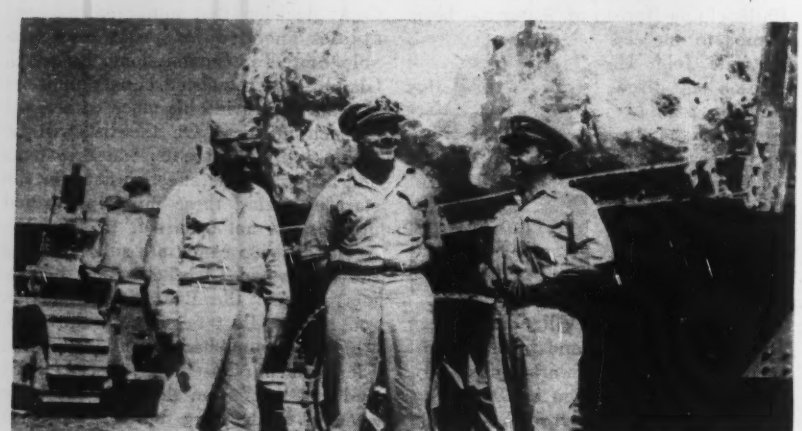
Thomas Stang, for 47 years an engineer with the Northern Pacific Railway, and since 1931 superintendent of bridge and buildings for the Idaho division, has retired. First joining the railroad at St. Paul, Mr. Stang has worked on all parts of the system. He is succeeded by **A. R. Ainslie,** formerly with the Dakota division.

Capt. William V. Sprinkle of Durham, N. C., has returned after 23 months overseas as regimental adjutant with the 372nd Engineers and has reported to Fort Belvoir, Va., for redeployment training. Overseas his battalion constructed hospitals and bridges in France, Luxembourg and Germany.

Tall tales of tough surveying on the Canol project are told by W. J. WENZEL (left) assistant chief engineer for Corwin and Co., Great Falls, Mont., consultants. Audience is FRED DUDLEY, Great Falls contractor.

Homer A. Hunter, superintendent of the Dallas, Tex., Water Department, was recently named assistant city manager. Mr. Hunter will retain supervision over waterworks operation. **K. F. Hoefle,** engineer of construction and maintenance for the waterworks, becomes acting superintendent for the municipal utility.

The Milwaukee Railroad has announced that **E. W. Bolmgren,** division engineer at La Crosse, Wis., has been appointed division engineer in Minneapolis to succeed the late A. Daniels.



Pacific island conference. Left to right—Comdr. E. B. CAVALLO, officer in charge, naval construction regiment; Comdr. F. L. ENDEBROCK, officer in charge, Naval construction battalion, and Lt. Comdr. J. S. GLUNT, executive officer. That stuff in the background is coral rock being hauled for fill.

MEN

Walter Lakosi, division engineer Mason City, Iowa, has been named succeed Bolmgren at La Crosse **I. C. Brewer,** assistant engineer at Crosse, succeeds Lakosi at Mason C

Robert P. Curley, president of W ter Curley & Son, general contract has been named Public Works Comm sioner of Boston, Mass., to succeed W liam T. Morrissey, who has resigned become chairman of the Metropoli District Commission.

Richard G. Johnson has been pointed full-time executive vice pr dent of the Canadian Construction sociation with headquarters at Ott

J. W. Southin, former munic engineer for Point Grey, Vancou B. C., has been appointed city engi for Prince Rupert.

Maj. John C. Pounds, Jr., of Ral N. C., has been awarded the Br Star for rendering "meritorious and valuable service" from April 21, 19 to October 18, 1944, in the Europ Theater "by his careful and deta planning of engineer work."

R. D. McGill, formerly regional gineer, Federal Works Agency, at C cago, has been appointed engineer resentative, waste water survey divi of The H. C. Nutting Co., Cincin Ohio.

J. F. Ward has been re-appoi manager of the Puget Sound dist office of the Bonneville Power Adm tration at Seattle to replace **Paul Hand,** who resigned to take over agership of the Okanogan Public Ut district at Okanogan, Wash. Mr. W a graduate of Northwestern Univer where he received a civil engineer degree, has been with the Bonne administration since 1938.

John E. Nicholls, former assis city engineer at Warren and You town, Ohio, has been named city gineer of Kent. Mr. Nicholls was merly employed by the New York Board of Water Supply on the D ware Aqueduct project.

Otto Lunn will be chief engineer the proposed McNary Dam at Um Rapids on the Columbia River u supervision of the Portland distri the Army Engineers. Former desi and field supervisor for building o

eir JOBS

onneville Dam, he recently was **resi**ent engineer for construction of **naval** agazines at Bangor, Ore.

Herbert Wickencamp has resigned Audubon County, Iowa, engineer to with the Armco Drainage and **Metal** roducts Co. in Des Moines. **Raymond** osenkild has been appointed acting gineer for the county.

Lieut. Col. W. N. Rushing, former ld superintendant of the American onstruction Co. of Houston, Tex., has cently been promoted from major. He s been serving with the U. S. Engiers Corps in the Aleutians.

David H. Harker, engineer and chief staff for the Ohio Water Supply oard since its organization in 1942, cently resigned to become chief enneer for the newly created Indiana lood Control and Water Resources ommission.

Harold E. Senf, Middletown, Ohio, s been appointed Warren County gineer, succeeding Sam D. Henkle, ho resigned Aug. 1.

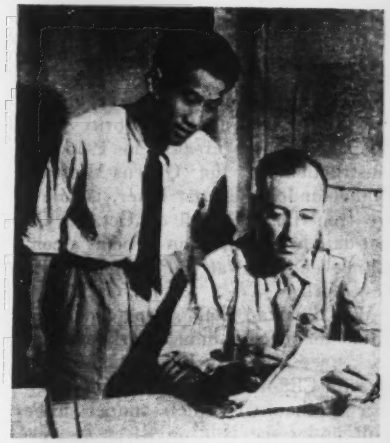
Christian L. Siebert, executive engier in the Bureau of Sanitary Engineerg and long-time employee of the nnsylvania Department of Health, rently resigned. He will enter private actice as a consulting engineer in mp Hill, Pa.

D. M. Lamdin, formerly of Jacksonlle, Fla., where he was engineer of aintenance of way in the Southern vision headquarters of the Atlantic ast Line Railroad, has been apinted assistant to the chief engineer at lmington, N. C. **W. J. Turner,** who s been principal assistant engineer at lmington, has succeeded Mr. Lamdin Jacksonville.

Harlen H. Smith, civil and structural gineer, has opened offices at Seattle, ash. He formerly was a construction gineer for the Henrik Valle Construcn Co. of Seattle.

Ivan Oakes, engineer in the Portland, re., office of the War Production ard, has been named as engineering alyst by the Willamette River Basin mmission and the Willamette Valley ojects Committee of Portland.

W. P. Greenawalt has resigned from United States Naval Reserve and has returned to Chicago where he will continue as a partner of Young & Greenawalt. As commander in the Civil Engineering Corps, Mr. Greenawalt was commanding officer of the 81st Naval Construction Battalion, during construction of twelve naval bases in the United Kingdom, and later had charge of Rhino Ferry operation, beach salvage and beach camp construction and maintenance for Utah Beach during the Normandy invasion.



Lt. Col. NATHANIEL P. TURNER, chief of the general engineering division, Service of Supply in the China Theater, explains specifications to a Chinese engineer. Col. Turner's office is now at Kunming, China.

C. U. Smith, former chief engineer of the Milwaukee, Wis., Harbor Commission, has been appointed city engineer of Lindsay, Calif.

Edward P. Willms, U. S. Public Health Service reserve corps assistant engineer serving as sanitary engineer in the Texas State Health Department at Austin, Tex., has been loaned to the Houston Health Department. His new duties probably will be to head the city's typhus control section.

Russell H. McCain, engineer of the Frederick Iron and Steel Co., has been appointed to fill the vacancy on the Maryland State Roads Commission created by the recent death of W. Frank Thomas.

Robert H. West has been appointed city engineer of Marshfield, Wis., after spending about 20 years in Illinois with various engineering and construction firms.

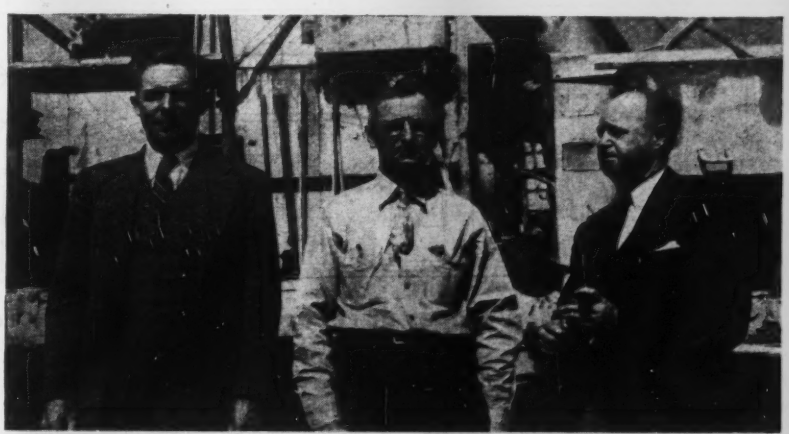
Arthur A. H. Buege, a civil engineer with the city of Wauwatoso, Wis., has been appointed acting building inspector to succeed **Walter J. Connell** who resigned to engage in private practice as a civil engineer.

Wayne C. Fletcher and **S. E. Freeman,** Little Rock, Ark., have been appointed chief and assistant chief engineer, respectively, for the Arkansas State Resources and Development Commission.

Charles Chandler, Yadkinville, N. C., retired recently as superintendent of the Southern Railway System at Sheffield Ala., being succeeded by **W. F. Cooper,** formerly at Atlanta, Ga.

Emblems and certificates for meritorious service were presented recently to four engineers by **Col. A. B. Jones,** district engineer at Jacksonville, Fla. The awards were given to **L. H. Cobb, E. M. Hinshaw, Wade H. Slappey,** and **Kenneth L. Warriner.**

Col. D. W. Griffiths has taken over as district engineer at Galveston, Tex.



BERT CRUMRINE (left) superintendent for Diamond Construction Co. on a highway bridge at West Point, Va., talks things over with H. E. PIERCY (center), senior engineer in charge for the state highway department, and R. P. ELLISON, personnel engineer in Richmond headquarters for the department.

Experiment station head retires at Vicksburg

Gerard H. Matthes, director of the U. S. Waterways Experiment Station at Vicksburg, Miss., for the past four years, will retire on Sept. 30 at his own request. His successor has not been designated to date.

A native of Holland, Mr. Matthes graduated from Massachusetts Institute of Technology with a B.S. of C.E. degree in 1895. During his more than 50 years as a civil and hydraulic engineer Mr. Matthes served with various municipalities, government agencies and for a short period engaged in private practice. He has been in the government service about 31 years, of which 17 years were with the U. S. Army Engineers.

G. H. Matthes

Mr. Matthes went to Vicksburg in 1932 as consultant to the president of the Mississippi River Commission. In that capacity he supervised much of the planning work on the system of cutoffs to lessen flood heights on the lower Mississippi River. He patented the method of tetrahedral concrete block revetment for riverbank protection, and invented a topographic slide rule for use in plane table surveying.

During the war, the experiment station under Mr. Matthes' supervision, conducted tests for the armed forces, including experiments with airplane landing mats, and flexible pavements.

Ole Singstad retires from tunnel authority

Ole Singstad, chief engineer of the New York City Tunnel Authority since that agency was created in 1936 for construction of the Queens-Midtown Tunnel under the East River, is to retire from that position on Oct. 1. On that date he will open an office as a consulting engineer at 15 Whitehall St., New York.

Mr. Singstad has been connected with subaqueous tunnel work at New York since 1909. In 1925 he succeeded the late Clifford Holland as chief engineer of the first vehicle tunnel to be built under the Hudson River at New York, and has participated as engineer or as consultant in the design and construction of most of the vehicle tunnels built since that time both here and abroad.

When consolidation of the operations of the New York City Tunnel Authority and the Triborough Bridge Authority was announced earlier this year (*ENR* Aug. 2, vol. p. 142) it was expected that Mr. Singstad would be retained as consultant until the end of this year.

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Terminal Island bridge work to continue

Construction of the $14,000,000 Terminal Island bridge and access highways to installations in Long Beach Harbor will continue unless Congress withdraws the appropriation, Vice Admiral Ben S. Moreell, chief of the Navy Bureau of Yards and Docks announced in Washington Sept. 14.

Adm. Moreell said the end of the war has not removed the need for the bridge. Bids on the first unit—the lift-span bridge itself and a mile of approaches—are due Oct. 3.

The total cost is divided to provide $10,000,000 for use by the Navy and $4,000,000 for access roads built by the Public Roads Administration. The State Division of Highways has supervised preparation of plans and acquisition of rights-of-way over a 5-year period.

The new bridge will replace a temporary wooden swing-span bridge built by the Navy early in the war.

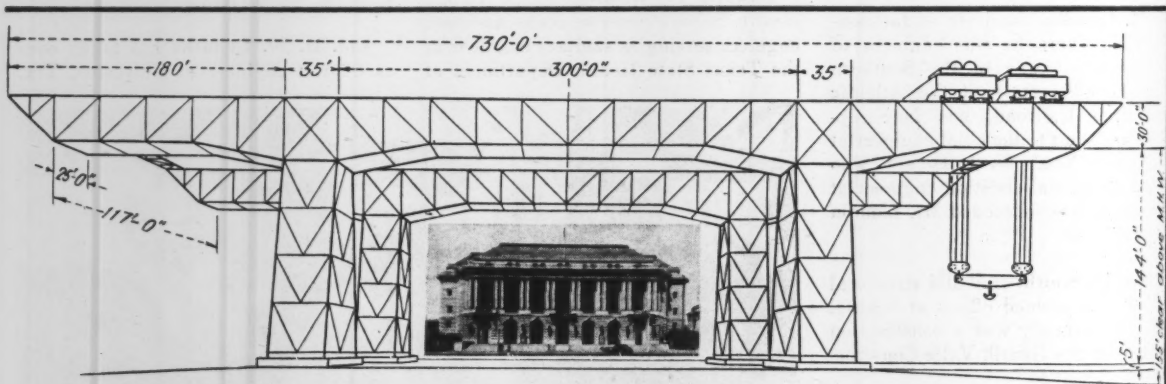
• • •

San Francisco names new city engineer

A new city engineer for San Francisco was named last week when Harry C. Vensano, public works director, appointed Ralph G. Wadsworth to replace John J. Casey. Mr. Casey left the position because of ill health.

Wadsworth will take over the $10,000-a-year post on Casey's retirement, expected to become effective early in October.

Wadsworth received his engineering degree from the University of California in 1914 and served as an officer in the 318th Engineers in the first World War. During the last 20 years he has been employed by the Fred H. Tibbetts Co., the Civil Works Administration and the state relief administration, and was Deputy State Administrator for the Works Project Administration.



Bridge cranes of record size for Hunter's Point drydocks

Two record-size bridge cranes, now being manufactured, are designed to speed repairs on naval vessels at Hunter's Point drydocks on San Francisco Bay where both cranes will operate on a single runway 730 ft. long, supported 185 ft. above mean high water by a novel steel structure providing 155-ft. clearance above mean high water.

The lifting capacity of each crane is 245 long tons and with an equalizer beam (itself weighing 40 tons) they will combine to lift a 450-long ton load. Cranes and full load make up a total moving weight of 1,784 tons which must be supported with the load center line 96 ft. beyond the outer edge of the supporting towers, of which there are four.

The crane runway will lie across a pier 40[illegible] ft. wide, and the 730-ft. runway length will include a 335-ft. center span and two 197-ft. cantilever arms. For purposes of comparison the illustration shows the steel crane structure drawn to the same scale as the picture of the San Francisco Opera House where the United Nations Peace Conference was held.

Two motor clubs sponsor Chicago-Detroit highway

Announcement has been made of the joint sponsorship of the Chicago-Detroit expressway by the Automobile Club of Michigan and the Chicago Motor Club. Such a move is significant in the field of highway construction in that it is the first time two such large organizations representing highway users have joined forces in promoting a modern highway to connect the two cities in question.

Construction of the Chicago-Detroit Expressway was begun in 1941 and it is complete as far as Ford's Willow Run plant.

No attempts will be made by either motor club to influence the location of the Chicago-Detroit route, which undoubtedly will be incorporated in the 40,000-mile National System of Interstate Highways provided for by the Federal Aid Highway Act of 1944. Selection of the route, choosing the standards of design and preparation of plans will be the responsibility of the various state highway commissions subject to the approval of the Public Roads Administration.

Activities of the two motor clubs will be confined chiefly to expediting the early development and construction of the Chicago-Detroit Expressway. Through the radio and newspapers, and by personal contact with communities to be benefitted by the new highway, the motor clubs plan to focus attention on the value of the proposed improvement and the desirability of obtaining, as soon as possible, a modern, fast and efficient expressway connecting Chicago and Detroit, which are, respectively, the second and fourth largest cities in the United States.

Samuel C. Hadden, former chairman of the Indiana State Highway Commission, and immediate past president of the American Association of State Highway Officials, has been engaged as consulting highway engineer by the two sponsoring organizations. He will devote his full time to expediting the promotion and development of this expressway work.

Special committees have been named by both clubs to assist Mr. Hadden. The Detroit committee includes, Charles T. Bush, chairman; Richard Harfst, general manager of the Automobile Club of Michigan, Ralph Thomas, James Verbor, William G. Bryant and William A. Brush.

Charles M. Hayes, president of the Chicago Motor Club, is chairman of the Chicago committee.

Other members include J. J. Cavanaugh, J. E. Bulger, J. H. Braun and F. C. Sielski.

San Diego Aqueduct work is started

San Diego's 71.57-mi., $17,500,000 aqueduct to obtain Colorado River water was officially started with ground breaking ceremonies Sept. 12, attended by Navy authorities in charge of the project and by San Diego and Los Angeles water officials.

Capt. Alden K. Fogg, 11th Naval District Public Works officer in charge of the project, pulled the lever of the power operated drag line that gathered the first scoop-full of earth.

The aqueduct, which will bring an estimated 50,000,000 gpd. of water daily to San Diego and its important naval establishments, will tap the Metropolitan Water District's line on the San Jacinto River. From there it will flow by gravity to the San Vicente Reservoir several miles east of San Diego (*ENR*, July 26, 1945, vol. p. 90). The drop will be from El. 1,503 ft. to 760 ft., representing an average declination of 15 ft. per mile. No booster pumps will be necessary.

The line will yield 77½ cu.ft. of water per sec. The pipe will vary from a diameter of 93 in. to 42 in. in order that a constant rate of flow may be maintained. Actually the aqueduct will have 2⅓ miles of 93-in. pipe, 8½ miles of 72-in. pipe, 32½ miles of 52-in. pipe, 22½ miles of 49-in. pipe and 1 mile of 42-in. pipe, all of concrete.

Operations were begun at the northern end of the line where the Guy F. Atkinson Co., of Long Beach, Calif., holds a $1,164,885 contract for building 2.1 miles of pipeline, a regulating reservoir and diversion structure.

Officials present at the ceremony besides Captain Fogg, were: Capt. George M. Ravenscroft, chief of staff to Rear Adm. W. L. Friedell, 11th Naval District commandant; W. P. Whitsett, chairman of the board, Los Angeles Metropolitan Water District; Julius Hinds, general manager and chief engineer, Metropolitan district; Fred Rhodes, San Diego city manager; Fred Pyle, San Diego hydraulic engineer; Comdr. R. D. Thorson, resident Navy officer in charge of the project; R. B. Ward, Bureau of Reclamation representative; Guy F. Atkinson, chairman of the board, Guy F. Atkinson Co.; Fred Heilbron, chairman of the board, San Diego County Water Authority, and J. L. Burkholder, general manager and chief engineer, San Diego County Water Authority. Mr. Burkholder was the engineer in charge of all construction when the Metropolitan Water District aqueduct was built.

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Congress resumes probe of Inter-American road

Hearings regarding the work of the U. S. Army Engineers on construction of the Inter-American Highway in Central America were resumed this week by the Senate Special War Investigating (Mead) committee.

Before Congress held its summer recess the committee considered the Army's expenditure on the highway (*ENR* July 19, vol. p. 71) and the reasons for starting the work project and why it was continued after its value as a war job had decreased (*ENR* Aug. 2, vol. p. 137). Remaining features of the undertaking to be discussed include equipment rentals, profits of the contractors, and efficiency on the job.

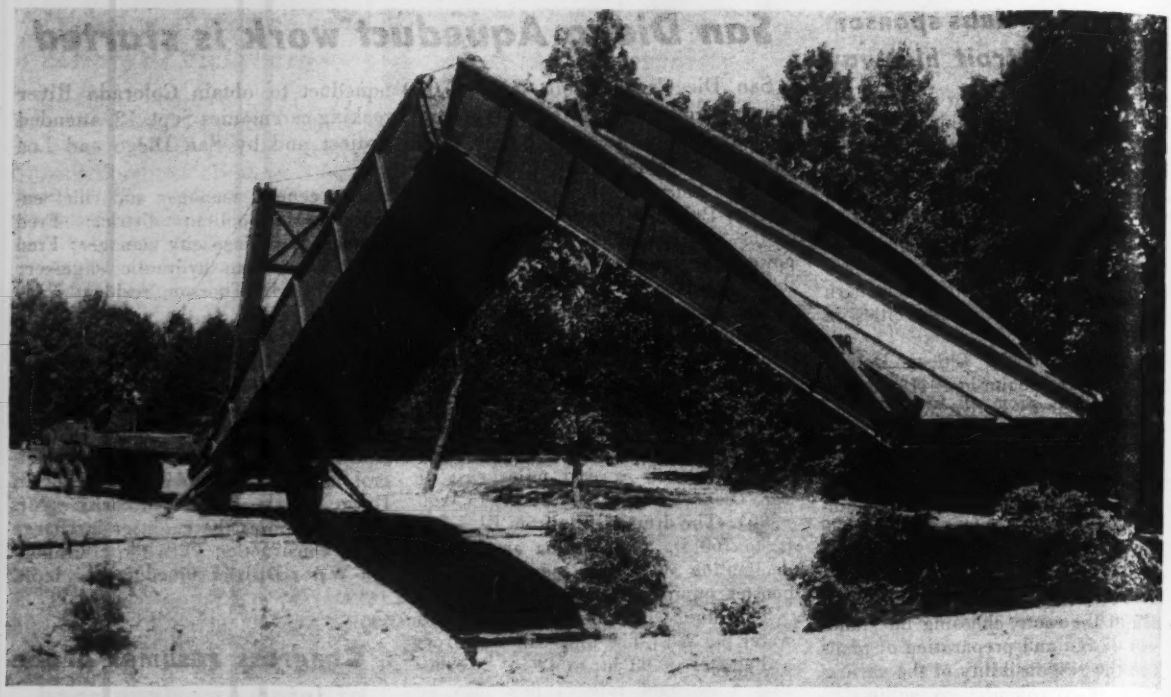
N. Y. State upheld on Niagara water rent

The right of New York State to charge the Niagara Falls Power Co. rent for the use of 15,000 cfs. that it has diverted from the river above Niagara Falls for many years for power purposes under earlier grant was upheld on Sept. 19 by Justice Francis Bergan of the state Supreme Court in session at the state capitol.

The action was begun by the company in an effort to invalidate a law passed by the legislature in 1943 asserting the state's prior claim to the water.

Justice Bergan said that it can scarcely be believed that earlier legislatures, in granting the right to use this natural resource, believed that it was being placed for all time beyond the control of the people of the state. He observed further that no one would question the state's right to interfere with or even destroy the company's riparian rights in the interests of navigation on the river, hence that it was not "very much more doubtful that if the state has the power to act in the preservation of public waters in the public interest, that it may do so in the direction of preserving to the people the energy of Niagara Falls by a clearly expressed statute for that purpose, regardless of the rights it may have previously created, permitted or allowed.

It is understood that the company expects to carry the case up to the state's highest court, the Court of Appeals.



Installed in 15 to 30 min. by a 6-man crew, this aluminum bridge has an 80-ft. span and accommodates 35-ton loads.

Army Develops Portable Scissors Bridge

An 80-ft. span trailer-launched scissors bridge, which can be installed in 15 to 30 min. by six men, has been developed by the Army. It is one of the special combat tools perfected by American engineers late in the war and now permitted to be described.

Sometimes called a mobile self-launching bridge, the unit provides a rapid means of spanning small streams for vehicles and tanks weighing up to 35 tons. The bridge proper is a 13-ton aluminum plate-girder assembly hinged at the center to fold in half. The normal roadway width between curbs is 9 ft. 6 in., but it can be increased to 10 ft. 10 in. by means of hand-operated worm gears integral with the bridge and attached to telescoping floorbeams. The deck consists of longitudinal 2-in. timber planking.

The bridge is transported on a single-axle semi-trailer 51 ft. long and 9 ft. 4 in. wide, this width permitting the girders to straddle the trailer. The height of the trailer with the load in place is 13 ft., and the overall length of the vehicle is 63 ft. The hauling unit has a minimum turning radius of 55 ft., and it is equipped with a rear-wheel hydraulic steering device to facilitate backing the trailer into the proper position necessary for launching the bridge.

The girder assembly, which is pivoted on trunnions at the rear end of the trailer, is launched with winches and hydraulic rams powered by a 45-hp. air-cooled gasoline engine mounted below the floor of the trailer. Before launching operations are begun, the rear end of the trailer is partially supported on two hydraulic jacks to avoid an excessive load on the rear tires. Also, a tie-down at the front of the trailer is tightened to make the tractor-truck act as a counterweight. The only preparation of the erection site consists in providing stable and relatively level bearings for the ends of the structure.

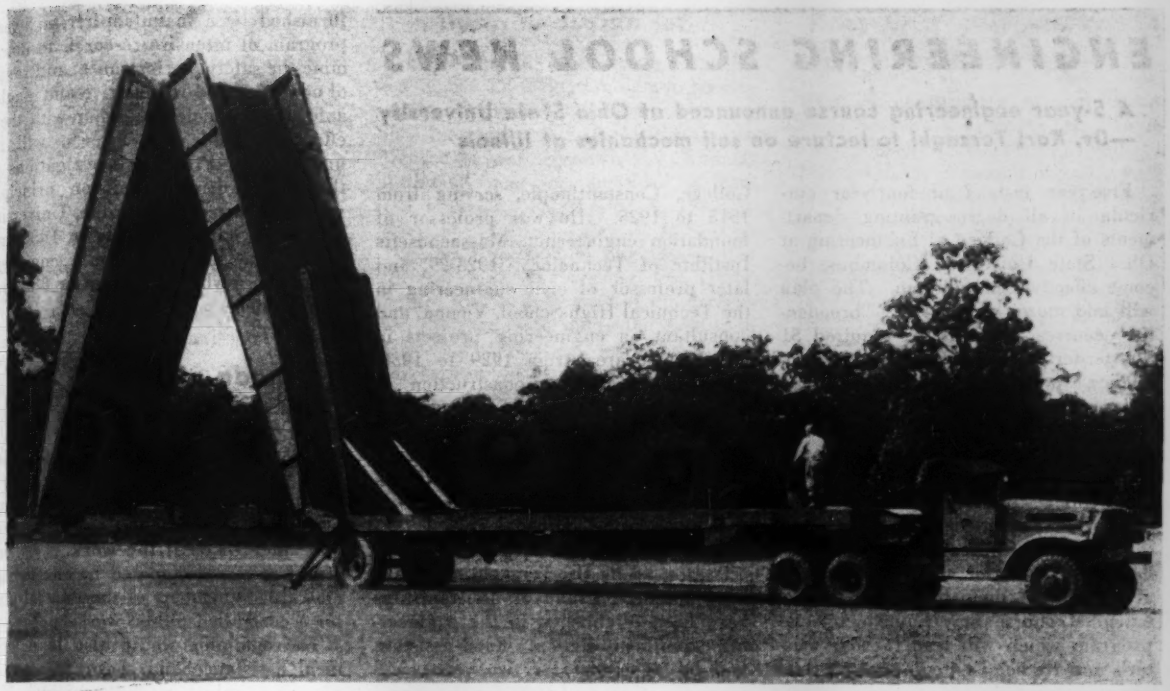
Launched with 3 or 6-man crew

The launching operation requires only 15 to 30 min. by a six-man crew; in an emergency three men can do the job. A boom powered by two hydraulic telescoping rams raises the girder assembly to slightly beyond vertical equilibrium. Travel from this position onward is controlled by two "launching" cables extending from a winch at the front of the trailer to the midpoint of the girders, and by "spreader" cables extending from a hydraulic ram mounted below the trailer floor along the top flange of the girders to the outer half of the assembly. The latter cables spread the two halves of the bridge into an 80-ft. span as they are lowered.

Once the far end of the bridge is supported on the abutment the launching cables attached to the midpoint of the girders are slacked off and a new hitch made at the near end of the bridge. This connection permits the bridge to be unhinged from the trailer and lowered onto the near abutment.

The bridge was scheduled for use in the war theaters in November. It was built at Fort Belvoir by the Engineer Board, Brig. Gen. J. W. N. Schulz, president. The original design was proposed by Capt. Lester P. Frost, while a sergeant in the 115th Combat Engineers, his drawings and calculations having been submitted to the Engineer Board in February, 1942. The design was considered so good that Sergeant Frost was recommended for officer's candidate school.

Following graduation he was subsequently placed on duty with the Engineer School, and in June, 1943, Frost, then a first lieutenant, was assigned to the technical staff of the Engineer Board to supervise design of the bridge. The



In launching the bridge a boom operated by two telescoping jacks raises the girder assembly to a vertical position. The remaining travel is controlled by two winch-operated cables joined to the midpoint of the assembly and by a pair of "spreader" cables extending outward along the top of the near girders to the outer half of the assembly.

technical staff of the Engineer Board in cooperation with the Heil Co., Milwaukee, Wis., built and tested the first accepted bridge.

Three tank-mounted self-launching bridges of 35-ton load capacity have been developed in addition to the trailer-launched unit described. These three are: The British Valentine Bridge, which has a 32-ft. span, and two types of American bridges of 40-ft. span developed by the Engineer Board.

When the bridge is loaded onto the trailer for transportation to the erection site the maximum height of the load above roadway level is 13 ft. and the greatest width is 11 ft. 10 in. The total unit weighs 37 tons.

Normal width between curbs is 9 ft. 6 in. but this dimension can be increased to 10 ft. 10 in. by means of hand-operated worm gears attached to the telescoping floor beams.

ENGINEERING SCHOOL NEWS

A 5-year engineering course announced at Ohio State University —Dr. Karl Terzaghi to lecture on soil mechanics at Illinois

Five-year instead of four-year curricula in all degree-granting departments of the College of Engineering at Ohio State University, Columbus, become effective this autumn. The plan will add more "cultural" or "broadening" courses. It calls for required 51 quarter-term hours of studies in economics, political science, sociology, geography, psychology, history, etc.

Present engineering students, returning students whose work was interrupted, and students transferring from other colleges, until two years after the war will be permitted to choose between the four and five-year curricula. Students with superior academic averages at the end of their third year of the extended course may enter a special program which will lead to both master's and bachelor's degrees at the end of five years.

Dean Charles E. MacQuigg said, "The belief is becoming more and more general that in the past the technological plan of engineering education has not permitted the introduction of other subjects essential to the well-informed college graduate. Such studies as mathematics and the natural sciences are broadening and cultural, but they are not enough to orient the engineering student in the broad social problems to which his work as an engineer is bringing him ever closer."

The dean said that the plan is patterned to meet the needs outlined by the Society for the Promotion of Engineering Education in a report by the society's Committee on Engineering Education after the War. Cornell University and other institutions have already adopted this plan.

Research and graduate study in soil mechanics at the University of Illinois have been given further impetus by the appointment of Dr. Karl Terzaghi, internationally known authority on soil mechanics, as non-resident lecturer and research consultant in civil engineering in the graduate school.

Dr. Terzaghi was born in Prague, Czecho-Slovakia, and was educated in the Technical High School, Graz, Austria. He served as superintendent of construction on reinforced concrete bridges and hydro-electric developments in Austria, Hungary, Croatia and Russia, before coming to the United States in 1913. After serving on several construction projects here, he became professor of civil engineering in Robert College, Constantinople, serving from 1915 to 1925. He was professor of foundation engineering, Massachusetts Institute of Technology, 1925-29, and later professor of civil engineering in the Technical High-School, Vienna, and consultant on engineering projects in the Vienna area from 1929 to 1938, when he engaged in construction of numerous dams and foundations throughout Europe. From 1938 on, he has lectured on soils and foundations at Harvard University. He has written several books and over 100 papers on civil engineering subjects.

To carry out special research projects directed by Dr. Terzaghi, two half-time research graduate assistantships have been established in the engineering experiment station. Each assistant will be appointed for two years, will receive a stipend of $800 for the school year and will be permitted to pursue tuition-free graduate work on a half-time basis.

Under the direction of the College of Engineering of the University of Wisconsin and with a fund of $50,000 furnished by a manufacturer, a 5-year program of intensive research to determine the safety, performance, and range of operation of 4-wheel-drive and single-axle drive vehicles, together with their effect on roads and streets, will be undertaken. Previous investigations of the 4-wheel-drive propulsion principle were conducted by Purdue University and Iowa State University in 1930 and 1931. The LaFayette, Ind., engineers found the 4-wheel drive to be 88.2 per cent efficient.

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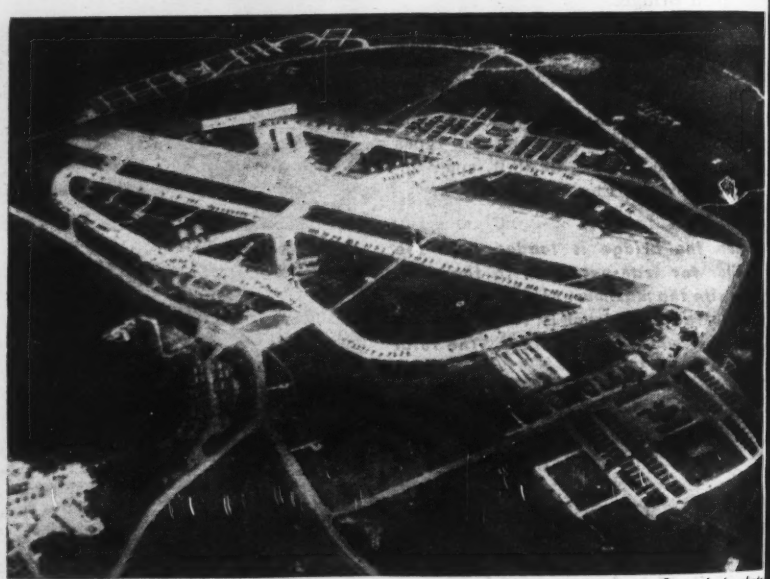
Canada offers aid for local public works

At a recent conference in Ottawa the Canadian government offered to make a grant of 20 percent of the cost of any provincial or municipal project before it is undertaken if the work is carried out at a time designated by the dominion—this being part of the federal plan for a controlled public works policy.

The dominion would also lend technical assistance and share the cost of planning public works projects. Municipal projects to be aided would have to have the approval of the provincial government. The dominion government says housing needs are of "urgent priority." To meet these needs, it was stressed, there must be "coordinated action at all levels of government."



Press Ass'n photo

Airfield may become permanent U. S. base

Shown above is the U. S. Naval airbase at Marpi Point, Saipan, one of nine bases naval authorities recommend the U. S. keep as permanent Pacific strongholds. The field was originally a Japanese airstrip. After capture of the base, the 51st Seabee battalion extended the existing 3,500 ft. runway to the 8,500 ft. length shown here, new construction consisting of an asphalt wearing surface on a coral base.

Brig. Gen. J. B. Newman new Army Air Engineer

Brig. Gen. James B. Newman, Jr., whose 9th Engineer Command paved the way for the 9th Air Force across France and Germany, has been named Air Engineer in the Army Air Force headquarters at Washington, D. C. General Newman's most recent assignment has been with the Atomic Bomb Mission in Japan.

A West Point graduate in 1918, General Newman was commissioned in the Corps of Engineers. After service as assistant to the district engineer at Louisville, Ky., he served from 1923 to 1931 as professor of military science and tactics at various midwestern universities. In 1936 he became district engineer at Ocala, Fla., and in September of 1936 was made military assistant to the district engineer at New Orleans.

After other service including assignments at Hawaii and as liaison officer between the Chief of Engineers and the Army Air Forces, he was ordered to duty with the Assistant Chief of Air Staff at Washington in October, 1941.

From November, 1943, until January, 1944, he was assigned to the 8th Air Force in England, and then assumed active direction of the 9th Engineer Command.

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Gen. Somervell submits request for retirement

Gen. Brehon B. Somervell, commanding general of the Army Service Forces, said in Washington last week that he had requested retirement, with terminal leave to take effect on the day Gen. George C. Marshall, Chief of Staff, vacates his position.

Since Gen. Marshall has not yet made public his own plans, the date when the two men will leave active service is not definite, although Washington observers expect it to be within from four to six weeks.

A West Point graduate in 1914, Gen. Somervell has had an outstanding career, almost all of which was pursued within the Corps of Engineers. He became head of the Services of Supply (now Service Forces) on its establishment in March, 1942, and has continued in that capacity through the organization's major wartime task of supplying and maintaining the Army in the field.

India dam design let

A contract for engineering plans for a $130,000,000 irrigation dam to be constructed in Punjab, India, was awarded the International Engineering Co. in Denver, Colo., recently, by Thomas Arthur Wyness Foy, engineer for Punjab province. (*ENR* Dec. 9, 1943, p. 856).

L. R. Young, chief engineer of the International Engineering Co., Pittsburgh, Pa., is in charge of the designs for the mammoth dam—the first in a series of irrigation works that the government plans to erect in Punjab.

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Army will soon stop use of German P.O.W. labor*

Replacement of prisoners of war with civilians at all army installations is planned by the Repairs and Utilities Division, Office of the Chief of Engineers. The U. S. Army Engineers, who in repairs and utilities activities alone, employ about 30,000 of these prisoners, have been informed by the Provost Marshal General that no German prisoners will be available after June 1, 1946, and that their return to Germany will be greatly accelerated after Jan. 1, 1946. Withdrawal of this help will open a number of jobs to civilians. In addition to the prisoners employed by the Engineers, there were about 40,000 employed in industrial enterprises, some of them on construction contracts directed by the Engineers.

Ross Dam cost increased new conditions

Cost of construction of the second step of Seattle's Ross Dam of the Skagit power project (*ENR* Sept. 20 vol. p. 378) has been increased an estimated $730,049 by broken rock encountered on both banks of the river, and by changes in spillway construction.

The rock condition had not been disclosed by preliminary excavation and diamond drilling, according to E. R. Hoffman, superintendent of the Seattle Department of Lighting.

Spillway surfaces will be changed from "flat" to "warped" as a result of studies and model tests. The additional work will bring cost of the new dam unit to $12,200,000.

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Wilder M. Rich dies; prominent city manager

Wilder M. Rich, 59, who had been municipal manager in various cities in the United States, died in Hackensack, N. J., Sept. 23. He was graduated from the University of Michigan in 1907 as a civil engineer. After serving with the U. S. Engineer department, and as city engineer for Sault Ste. Marie, Mich., he helped organize the City Manager Association of the United States. Cities he served included Sault Ste. Marie, Mich.; Goldsboro, N. C.; Alexandria, Va.; Ironwood, Mich., and Hackensack, N. J.

JOBS OF THE WEEK

ROD, WIRE and CABLE PLANT, Fort Wayne, Ind.

Wigton Abbott Corp., Plainfield, N. J., has been awarded a contract to build a rod wire and cable plant for Phelps Dodge Copper Products Corp., New York, N. Y. The estimated cost is $4,500,000.

ROSIN and TURPENTINE PLANT, Oakdale, La.

Stone & Webster Engineering Corp., New York, N. Y., has been awarded a contract by the Newport Industries, Inc., Pensacola, Fla. for a rosin and turpentine plant to cost $2,500,000.

GRAIN ELEVATOR, Superior, Wis.

James Stewart Corp., Chicago, Ill., has been awarded a contract by the Great Northern Railway Co., S. M. Nye, chief engineer, St. Paul, Minn., for a grain elevator to cost about $1,180,000.

DRUG PLANT, Trenton, N. J.

The Austin Co., New York, N. Y., will design and construct a 203x304-ft. plant to manufacture aspirin for the Sterling Drug Co., New York, N. Y. The estimated cost is $1,600,000.

RESIDENTIAL DEVELOPMENT, Baltimore, Md.

Loch Raven Corp., Care of Gustave Iser, architect, New York, N. Y., will construct a residential development and stores by its own forces. The estimated cost is $6,000,000.

Note—Additional bidding and contract news on many projects large and small, including the above items, appear in the Construction News section beginning on page 17.

OBITUARY

Frank W. Garran, 51, dean of the Thayer School of Engineering at Dartmouth College, died Sept. 18. Dean Garran was graduated from Norwich University, Northfield, Vt., in 1917, and returned there as an assistant professor after a year as head master of Atkinson Academy, Atkinson, N. H. He served on the civil engineering faculties of the University of Arizona, Tucson, Ariz., and the College of Charleston, Charleston, S. C., before going to the Thayer School in 1929 as an assistant professor. He was named dean in 1933. Under his direction, the Thayer School expanded its curriculum, increased enrollment and faculty, and moved into a new building.

Charles P. Chase, 77, pioneer civil engineer of Clinton, Iowa, and an authority on the Mississippi River, died recently at that city. Formerly, for ten years he was city engineer for Clinton. During the 1st World War he was chief engineer of the U. S. Bureau of Housing and Transportation at Washington. A past president and consulting engineer of the Iowa Engineering Co. Inc., Mr. Chase was the oldest past president of the Iowa Engineering Society.

Howard A. Keller, 57, Bucyrus, Ohio, division engineer for the Ohio State Highway Department, Ashland, was killed in a railroad crossing crash Sept. 14. Before his appointment early this year, he had served as Crawford County engineer from 1915 until 1919, and had served as a deputy under several of his successors. He was put in charge about two years ago of a geodetic survey for the federal government in Maryland and West Virginia, and then was named to the Ashland post.

Albert Dudley Saunders, 55, president of A. M. Hazell, Inc., New York, a subsidiary of the Arthur A. Johnson Corp., general building contractors, died at Great Neck, N. Y., Sept. 18. A specialist in sub-surface construction, Mr. Saunders supervised the building of several sections of the New York subways. In 1941 he went to Bermuda as general manager in charge of construction of the United States Army Air Base there, completed in 1943.

Charles E. Carey, 55, regional director for the Bureau of Reclamation at Sacramento since September, 1943, died Sept. 2 in Sawtelle, Calif. A graduate of the University of Oklahoma, Mr. Carey was associated with Westinghouse Electric Co., the National Resources Committee, Bonneville Power Administration and the Bureau of the Budget before joining the Bureau of Reclamation staff.

Boyle Irwin, 58, civil engineer, died Sept. 16 at Pottstown, Pa. He was associated with the United Engineers and Constructors, Inc., of Philadelphia. A descendant of three of the founders of the Society of Cincinnati, he was active in the restoration of historic homes in Valley Forge and Chester County.

Patrick Joseph Lynch, 60, Seattle, Wash., contractor, died in that city Sept. 10. He organized the Lynch Brothers Diamond Drill Contractors in Juneau, Alaska, 34 years ago, and since has held contracts on the Bonneville, Skagit, Grand Coulee and Shasta dams.

John A. Currie, 50, construction manager of the Foundation Maritime, Ltd., Halifax, N. S. general contractors, died Sept 17, in Halifax.

J. C. Ogden, 78, chairman of the board of directors of Robert W. Hunt Co., Chicago, Ill., died in Plainfield, N. J., Sept. 10. Mr. Ogden had been associated with the Hunt organization for the last 52 years. He was vice-president from 1923 to 1935, president from 1935 to March, 1945, when he was elected chairman.

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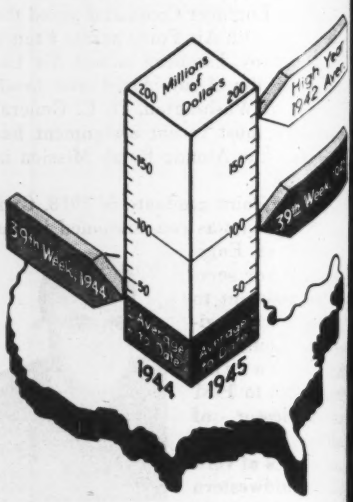
DeWitt Barlow dies; authority on dredging

DeWitt D. Barlow, 65, president of the Atlantic, Gulf and Pacific Co., and one of the country's foremost authority on river and harbor dredging work, died suddenly at his home in Plainfield, N. J., on Sept. 24.

A native of Philadelphia and a graduate civil engineer from the University of Pennsylvania in 1901, Mr. Barlow spent all but three years of his active career with the company that he headed at the time of his death. He began as a resident engineer on work for the company at Cape May, N. J., soon went to New York as office engineer, then became secretary and treasurer, and in 1911 was made vice-president and general manager. He became president of the company in 1921.

During World War I he was chairman of the Emergency Dredging Commission and associate chief of the dredging section, War Industries Board. He has been president of the National Association of River and Harbor Contractors since 1935.

CONSTRUCTION ACTIVITY



As Reported This Week to...
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of Sept. 27 1945	Cumulative 1945 (39 wk.)	Cumulative 1944 (39 wk.)
Federal	$5,352	$675,908	$897,1
State & Mun.	14,247	258,582	191,1
Total Public	$19,599	$934,490	$1,088,2
Total Private	69,218	561,764	291,2
U. S. Total	**$88,817**	**$1,496,254**	**$1,379,5**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Type of Work	Dollar Volume (Thousands) This Week	Cumulative 1945 (39 wk.)	Cumulative 1944 (39 wk.)
Waterworks	$991	$40,344	$24,4
Sewerage	1,041	24,213	23,8
Bridges	2,188	25,888	11,2
Highways	8,566	168,804	162,8
Earthwork, Waterways	1,293	38,301	53,6
Buildings, Public	3,058	413,548	510,9
Industrial	53,892	362,097	134,4
Commercial	10,616	129,560	114,3
Unclassified	7,172	293,499	343,7

NOTE: Minimum size projects included are: Waterworks and waterway projects, $15,000; other public works, $25,000; Industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1945 39 wk.	Cumulative 1944 39 wk.
NON-FEDERAL	$599,338	$348,8
Corporate Securities	139,360	96,7
State and Municipal	296,378	111,0
RFC Loans	24,600	57,5
REA Loans	60,000	20,0
Fed. Aid, Highway	79,000	63,0
FEDERAL	$1,049,898	$1,263,8
Total Capital	**$1,649,236**	**$1,612,6**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Sept. '45	309.28	148.8
Building Cost	Sept. '45	240.07	129.7
Volume	Aug. '45	119	52